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PUBLIC SUBMISSION – STORING RENEWABLE ENERGY

The majority of energy in Australia, 85%, is generated by coal-fired power stations, which produce 42% of Australia's greenhouse gas emissions. To cut greenhouse gas emissions and the dependence on declining stocks of fossil fuels, it is essential to switch to renewable energy.

Of all countries, Australia's CO2 emissions are among the highest per capita. Australia also has the highest annual average amount of solar radiation per square meter per annum. It has been calculated that Australia's total current primary energy consumption of approximately 5,500 PJ/annum could be met by an area of 4,000 km2 of solar collectors with an average of 20% conversion efficiency.

Why is solar energy not more developed and used in WA? The ready-made answer is because the solar photovoltaics only generate electricity during the day; they cannot be relied on to deliver energy at night or meet the peak demand. The general belief is that energy cannot be stored.

However, the vast number of projects worldwide prove that energy can, after all, be stored in a commercially viable way. These storages include for example microgrid, compressed air energy storages (CAES) and solar thermal storages. The storing of energy allows the use of solar power for both, baseload generation as well as peak power generation.

According to the Energy Storage World Forum, there are currently more than 400 individual microgrid projects planned, under development, or fully operating around the world and the global market is forecasted to pass $40 billion in annual revenue by 2020.

California has set a target of 1.3 GW storage capacity by 2020, equivalent to powering one million households, by implementing compressed air energy storages (CAES) that can hold energy up to 10 hours. The project is partly funded by the Department of Energy of US and the Public Utilities Office of California. Similar plants have been operating in Alabama and Germany for decades.

The third example for significantly reducing the cost of electricity is stored solar thermal energy. In a concentrating solar power (CSP) system, the sun's rays are reflected onto a receiver, which creates heat that is used to generate electricity. The receiver can also store energy depending on the media, which can be for example pressurized (water) steam, oil, or molten salt. Molten salt is liquid at atmospheric pressure, provides a low-cost medium to store thermal energy, its operating temperatures are compatible with today's steam turbines, and it is non-flammable and nontoxic.

One of the most challenging environmental and agricultural problems in WA, in particular in the Wheat belt, is the accumulation of salt, which is a consequence of massive deforestation. The effects of salt prevent it to be buried underground or dumped into the sea. Fortunately, of the tested thermal storage materials, molten salt has proven to be the best in transporting the sun's heat, which could provide a solution to two problems at once.

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There is no reason why the wealthiest, sunniest state of the sunniest continent should miss the opportunity to benefit from the latest technical innovations.

Sincerely

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